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Labor and the Labor Process in a Limited Entry Fishery

BONNIE J. McCAY

Department of Human Ecology
Cook College
Rutgers University
New Brunswick, NJ 08903

JOHN B. GATEWOOD

Department of Social Relations
Lehigh University
Bethlehem, PA 18015

CAROLYN F. CREED

Department of Human Ecology
Cook College
Rutgers University
New Brunswick, NJ 08903

Abstract *We examine aspects of labor in the harvesting sector of the surf clam/ocean quahog industry of the mid-Atlantic region of the United States in the context of limited entry. Vessel owners are both diversifying and cutting back on labor costs through crew consolidation in response to difficulties in the sea clam industry. A survey of crew-members on job satisfaction reveals more about the preferences and experiences of labor. We make predictions about the fate of labor under a new management regime based on individual transferable quotas. The analysis is intended to bring the interests of crew-members into the decision-making process and to improve the basis for predicting how future regulatory measures may affect crewing.*

Keywords Fishery management, labor, crewing, Atlantic sea clams, limited entry, social impact.

Introduction

Limited entry and, particularly, the quasi-privatization created by individual transferable quotas, are widely advocated ways to achieve resource conservation with minimal economic waste or inefficiency. Because these techniques are new in the United States, little is known about their effects on firms in fisheries (see DeWees 1989, for an analysis

Please send all correspondence to Bonnie J. McCay.

of early effects in New Zealand fisheries). Our concern is with their effects on workers in those firms, which we have narrowed to crew members (deckhands, mates, and captains) on fishing vessels.

Entry into the mid-Atlantic federal fishery for surf clams has been restricted through a vessel moratorium since 1977. This study addresses the labor process under that regime, particularly in recent years when the number of allowable fishing days has been sharply curtailed. Students of the labor process emphasize technological change and how it affects the nature of work and the composition and differentiation of the working class (Braverman 1974). We focus on regulatory rather than technological change and offer a narrower set of observations on the labor process.

The present study provides background to analysis of the social consequences of another regulatory regime, that of quasi-privatization under individual transferable quotas. In October 1989, the Mid-Atlantic Fishery Management Council voted to amend the Atlantic surf clam and ocean quahog fishery management plan by replacing the vessel moratorium and time-based indirect allocation system with an individual transfer quota (ITQ) system. The ITQ system is intended to rationalize the fishery by allowing it to operate at the lowest possible cost (for example, fishing effort, administration, and enforcement) for a particular level of catch . . ." (MAFAC 1988: 14), thereby achieving optimum yield (OY), defined in the Magnuson Act as maximum sustainable yield as modified by relevant social, economic, and ecological factors. The amendment grants percentage shares of the annual landings quotas for ocean quahogs (*Arctica islandica*) and surf clams (*Spisula solidissima*) to current holders of active permits for these fisheries. This amendment has been approved by the secretary of commerce and may be implemented in the fall of 1990. If it is, the Atlantic surf clam and ocean quahog fishery will be the first in federal waters to use such a direct allocation system. Similar management strategies are being considered in other federal fisheries (e.g., NPFMC 1989a, 1989b).

Because owners of vessels will be allowed to combine quotas on fewer vessels, a sharp decline in the number of vessels licensed for the surf clam fishery in both the mid-Atlantic and the New England regions is anticipated as well as a possible decrease in the number participating in the related ocean quahog fishery. Our study was done in anticipation of this decision and as the beginning of a social impact analysis of ITQs in an American fishery. It was done in the context of limited entry and time constraints on fishing activity, where large numbers of permitted vessels were allowed to work only 25 days a year. We felt that to assess the effects of a new management regime on labor, we would have to document and account for what was happening to labor under the old management regime.

We offer two approaches. The first method uses interviews with firm managers and owners to explore how their labor management practices have changed in response to sharp cutbacks in the numbers of allowable fishing days in the surf clam fishery. The second derives from a large project on job satisfaction in the fisheries, and looks at the situation of crew members, hired captains, and owners in a comparative perspective. Neither approach is adequate to the task of discerning and interpreting the changing situations of labor in the fishery and the nature of the labor process. However, our job satisfaction analysis contributes to an understanding of barriers (and motivators) to mobility across occupations, within the fisheries, and between fishing and other occupations. And our interviews about crewing gave us access both to data unavailable anywhere else and to the firm managers' interpretations of their situations and the decisions they made. We have moved toward a better understanding of the

labor process; that is, the effects of change on the nature of work and the behavior and attitudes of workers.

The Sea Clam Fishery and Management System

The sea clam fishery of the mid-Atlantic region of the United States involves two species: surf clams and ocean quahogs, both of which are harvested with large vessels and hydraulic dredges and processed into canned and frozen products. For technological and gastronomic reasons, surf clams have been more valuable than ocean quahog and were exploited earlier and at a higher rate. The commercial fishery began in the 1940s, and clear signs of overfishing were evident by the 1960s. Surf clams are found within state waters (within 3 miles of the coast) but also beyond, and commercial densities of surf clams are found in waters adjoining the states of Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, and Virginia. Accordingly, the fishery was difficult to regulate until 1977 when federal fisheries jurisdiction over waters 3 to 200 miles from shore was established.

The mid-Atlantic surf clam and ocean quahog fishery has been intensively managed by federal and state governments since 1976–1977 (Nicholls 1985; MAFMC 1986a). In 1977 a vessel moratorium was imposed on the Mid-Atlantic surf clam fishery of the exclusive economic zone (EEZ, 3–200 miles), and since then an average of 128 vessels has been engaged in this fishery, although 142 are licensed for it (as of 1987). The original fishery management plan (FMP) was conceived as an emergency response to the long-term decimation of important clam stocks and to the effects of a short term anoxic event that affected major clam beds off the New Jersey coast in 1976. The state of New Jersey also created a management system for the surf clam fishery within its waters. Regulation of the ocean quahog fishery, which takes place in federal waters, involves only an overall quota and logbook reporting requirements; this fishery has been an important alternative to surf clamming for many of the larger vessels in the fleet as well as vessels never engaged in surf clamming.

The 1977 FMP for surf clams and ocean quahogs caught in the EEZ also established quotas. The surf clam quota, allocated in quarterly segments in a complicated system administered by the regional director of the National Marine Fisheries Service (NMFS), has remained roughly the same since 1977. The clam populations have been restored to fairly high levels of abundance and quality although they are based on only two strong year-classes. Catch per unit of effort has therefore increased, helped also by dramatic improvements in the catching efficiency of the vessels since 1977.

Management had two goals: (1) to rebuilt the stocks; and (2) to prevent further overcapitalization and perhaps reduce the level of capitalization in the industry. The 1977 management system and its successive amendments helped nature do the former but failed miserably at the latter. Vessels race to get the limited quota each quarter, and owners and crew-members do their best to improve catching efficiency to this end.

The major debate in the 1980s is how to change the management system to better deal with the fact that 133 vessels (as of 1987) are active in the surf clam fishery but fewer than one-tenth of that number could easily take the entire year's quota (see Surf Clam Task Force 1986). The quota can be reached very quickly and by very few vessels. But because 142 vessels have permits to compete in this limited entry fishery, the quota is in fact spread among large numbers.[1] The quota is handled in quarterly chunks, and in the present system fishermen compete for it within time constraints imposed by NMFS

so that production is spread out over the entire year to help processors manage labor and inventories.[2]

Overcapitalization, Vessel Consolidation, and Crews

Overcapitalization was worsened by the management system, a fact well documented and the major argument for changing the system (Strand, Kirkley, and McConnell 1981; Keifer and Freese 1981; Freese 1985; Nicholls 1985; MAFMC 1986b; see also Rettig 1984; Turgeon 1985; McCay and Creed 1990). Members of government agencies, management councils, the scientific community, and industry involved in surf clam and ocean quahog management have come to an agreement on a system that will reduce the number of vessels involved through ITQs similar in broad outline to those developed for New Zealand (Crothers 1988). The agreement, approved by the secretary of commerce in March 1990, is known as Amendment #8 of the Fishery Management Plan for surf clams and ocean quahogs (MAFMC 1988). Depending on the future economics of clamming, the fleet may be reduced dramatically in size within a short period, solving the overcapitalization problem. How will that affect labor? In this article we address the question retrospectively, asking about past changes in labor practices and posing hypotheses for the future.

We report on findings about employment issues in the harvesting sector from field research done between 1984 and 1987. The first section, based on interview work, concerns changes in labor or crewing strategies on the part of managers of fishing firms (vessel or fleet owners and fleet managers) as they try to adjust to management restrictions on the amount of time allowed for surf clamming in mid-Atlantic waters. We observe the extent to which firm managers have responded to management-induced and market-induced problems by reducing the number of people employed to work on the clam boats. One strategy is known as "crew consolidation," or using crew members on more than one boat. The other is diversification, or moving into other fisheries.

Crew consolidation and diversification occur in a situation in which firm managers are not allowed to reduce the number of boats they use without losing access to rights to fish for surf clams (today in the form of rights to a predetermined number of fishing days). The situation will change with Amendment #8, which will allow managers to use their quota allocations on however many vessels they choose.

It is thus critical to identify the people potentially affected as well as trends in labor that already exist. The second point addressed is who are the crew-members. Who are the captains, mates, and deckhands who work on the surf clam and ocean quahog dredge boats? What are their alternatives and preferences? Fishery management plans rarely answer these questions, and at best provide employment statistics for coastal counties that are next to useless, particularly in highly urbanized areas where fisheries employment is probably a tiny fraction of countywide employment. Results of a survey done in 1984–1985 allow us to depict crew characteristics and the structure of their job satisfaction in comparison with crew members in other fisheries and in relation to other work opportunities.

Fishing Firm Strategies: Labor Consolidation and Fishery Diversification

Reliable data are not available on aggregate changes in employment in the fishing industry of the mid-Atlantic states. We were, however, able to combine data obtained from

personal interviews with data from NMFS license files to create information on the employment patterns of 98 vessels as of September 1987. These data, and assessments of vessel owners interviewed, suggest that vessel owners are responding to market- and management-induced problems in the surf clam fishery by both diversifying their fisheries and consolidating crews.

Crew Consolidation

Labor—usually paid on a share basis—is a major cost of operation in fishing. To the cost of the shares given to deckhands, mates, and hired captains must be added the premiums for liability insurance, which have risen greatly since the early 1980s. Adding the fact of a soft market for surf clams and ocean quahogs, particularly since the summer of 1986, one can see that vessel owners and managers are interested in lowering labor costs. One way this can be done is to improve labor efficiency through mechanization of the fishing operation, e.g., larger vessels that have adopted conveyor belt sorting and culling of clams. Another is to rotate workers among different boats (what we usually mean by crew consolidation).

Further incentives to reduce employment come from the management system itself. Adjusting quarterly quotas to the fact of rising catch per unit effort, the regional director of the NMFS Northeast regional office has had to reduce the number of allowable surf clam trips and hours per trip. For much of the period 1981–1984 vessels were allowed to fish 24, and then 12 hours per week, a severe limitation to a fishery in which vessels worked four or five days a week before 1977. The vessel owners whom we interviewed pointed out that incentives to consolidate crews (using a deckhand, mate, or captain on more than one vessel in a fleet) increased in response to the major reduction in fishing time that began in 1984. By May 1985 catch rates were so high that vessels could go out only six hours every other week, and in most of 1987 vessels were allowed to dredge for clams six hours every third week (see MAFMC 1988: 98). Before long surf clammers (but not ocean quahoggers) were allowed only 6 hours a week, and then 6 hours every other week, and extended closures were effected, all in response to the hefty increase in catching efficiency of the mid-Atlantic surf clam vessels.

The trend of crew consolidation increased when the price of surf clams dropped in response to the discovery of surf clams in New York inshore waters in 1986, as well as landings from New England waters. This "feeding frenzy" resulted in a glut and a drop in the price of surf clams, while at the same time the number of allowable trips was reduced even more. In 1987 mid-Atlantic surf clam permit holders (which includes about six vessels from New England) made as few as 25 trips per year in that fishery.

Given the long periods in which vessels are not allowed to work in the mid-Atlantic surf clam fishery and the appreciable cost of labor, one would expect that owners of two or more vessels would begin running both with some or all of the same crew. This reduces the owner's costs by (1) reducing the number of people on the payroll; (2) making it possible to select for the more productive, more reliable, and less injury-prone workers; and (3) lowering liability insurance premiums. In addition, owners may be forced to consolidate because of the difficulty of finding someone reliable to work on a vessel when the vessel goes out very seldom and if the price of clams is low as was true in 1987. Many vessel owners said this was happening, but we tried to substantiate what they said by investigating data they provided and what we obtained from NMFS.

The Fall 1987 Interview Sample

In August and September 1987, we carried out a survey of surf clam and ocean quahog owners in the major mid-Atlantic ports (from Point Pleasant, NJ in the north, to Oyster, VA in the south). We talked with vessel owners, managers, and other representatives of 25 firms, partnerships, and sole-owner enterprises that owned 74% (98) of the 133 vessels active in the mid-Atlantic surf clam fishery during 1987. The sample represents the full range of ownership types and fleet sizes in the industry. A major socioeconomic and cultural distinction found in this fishery is between vertically integrated fleets (processors) and fleets and individual boats that are not owned by processors (independents). Table 1 shows the number of firms in our sample and the sizes of their fleets broken down by ownership category.

Each clam vessel requires from three to five crew, depending on its size, the number of dredges operated, and management preferences. Since we are interested in the extent to which firm managers move crew members among their vessels (rather than hiring a full crew for each vessel), the appropriate unit of analysis is the firm, not the vessel. By firms, we mean the identifiable owners or groups of owners of vessels, whether corporations, partnerships, or sole-owner enterprises.

In personal and telephone interviews, we asked firm managers—identified with the help of fishermen and NMFS—about the number of people actually working for their fleets, including hired captains and mates, as distinct from the number of crew used per vessel. We refer to this figure as the number of hired crew. We also asked how many owners work regularly on one or more boats. Combining these figures gives the total crew working on the firm's vessels, which when divided by the number of vessels yields the total average labor force per vessel.[3] Table 2 includes these data by type of firm.

For the overall sample of 25 firms, the average fleet size was 3.9 vessels per firm, the average number of hired crew was 12.6, the average total crew (employees plus working owners) was 13.3, the average hired crew per vessel was 3.4, and the average total crew was 3.8. The difference between hired crew and total crew is important among the independents, but not among the processor firms. Whereas independent own-

Table 1
Sample by Firm Types, Fall 1987 Interviews

Firm Type	Enterprises	Vessels[a]
Vertically Integrated Fleets[b] (2–16 vessels)	5 (19.2%)	44 (44.9%)
Independent Fleets (2–14 vessels)	8 (30.8%)	42 (42.9%)
One Vessel per Enterprise	12 (46.1%)	12 (12.2%)
Total	25	98

[a]Vessels = No. of vessels actually operating in the fall of 1987. A few others are tied up, hence not manned.

[b]Fleet = Definition of *fleets* is taken from respondents. In some cases, the individual enterprises are in fact interwoven in terms of ownership, but are described as belonging to certain individuals. A set of five vessels that are registered to five closely related men may be considered a fleet by respondents.

ers often captain one or another of their vessels, none of the owners of the five vertically integrated firms in the sample work regularly on their vessels.

Comparison of Interview and NMFS Data

The U.S. Coast Guard and NMFS collect data on the number of crew per vessel in their routine registration and licensing of vessels over 5 GRT capacity. Their numbers refer to the usual number of positions on each boat, not to the number of people who fill those positions. Thus, one measure of the extent to which surf clam and ocean quahog firms are reducing labor costs by having individuals work on the crews of two or more vessels is to compare the average number of crew positions on a boat according to the NMFS license data with the average number actually working per boat according to our interview data.

We had data on crew size (including captain) from both our interviews and NMFS licenses for 19 firms. For comparability, we averaged the NMFS data on number of crew positions per vessel and reduced the data to 19 clusters corresponding to the separate firms. The NMFS data show a mean of 4.611 positions per boat, whereas our interview data show a mean of 3.747 actual people per boat. This difference is statistically significant ($p > .05$, one-way ANOVA). In other words, there are fewer people manning the boats than there are positions on the boats, nearly one full crew member less per boat. This supports the hypothesis that firm managers have responded to cutbacks in allowable fishing time and rising insurance rates by consolidating crews.

The measure is imperfect. The NMFS data we used are not updated each year. Consequently, the difference may also reflect overall reduction in average crew size over time resulting from mechanization of the deck work. However, this too would be an indicator of reduction in the use of labor.

A final point is that crew consolidation seems to vary by the type of firm (see Table 2). Vessels that are part of independent fleets tend to have smaller crews than either processor-owned vessels or individually owned vessels. The average total crew (employees plus working owners) per vessel in the independent fleets is 3.2, whereas it is 4.05 for the processor fleets. (Average total crew is 4.1 for individually owned vessels, but they cannot easily consolidate crew size by rotating individuals among boats). This suggests that owners of independent fleets are making greater use of the crew consolidation strategy than are processor-owners, perhaps because they have less opportunity to diversify into other fisheries, as we will discuss later.

Diversification: Ocean Quahogging and the New Jersey Inshore Fisheries

Our study shows that crew consolidation has been substantial, but harvesting firm managers have also responded to cutbacks in allowable fishing time and other economic pressures by using their crews and clams vessels to engage in other fisheries, albeit within the sea clam industry. Many captains and owners told us that retaining their crews required involvement in ocean quahogging, which is essentially an open access fishery because market demand has not yet pushed catch rates to the level of the quota, and in the New Jersey inshore surf clam fishery, a highly restricted fishery that is allowed from November to May.

Crew size is significantly correlated ($p < .01$) with whether or not a vessel is or has recently been ocean quahogging. This effect in our sample is intensified by the fact that most vessels in one of the largest fleets had begun ocean quahogging in 1985–1986,

Table 2
Summary Data on Crew Size, Surf Clam, and Ocean Quahog Firms from Fall 1987 Interviews, by Type of Firm

	Vessels	Hired Crew[a]	Hired Crew/Ves	Owners Who Clam	Total Crew[b]	Total Crew/Ves	(%) Quahogging
				Fleets[c]			
N = 8							
Average	5.25	12.5	2.85	0.75	14.0	3.2	0.5
Std. dev.	3.9	7.5	1.8	0.4	7.7	1.8	0.3
Min	2.0	3.0	1.0	0.0	4.0	1.3	0.0
Max	14.0	24.0	6.5	1.0	28.0	7.0	1.0
				Individuals			
N = 12							
Average	1.0	3.6	3.6	0.5	4.1	4.1	0.6
Std. dev.	0.0	1.4	1.4	0.5	1.1	1.1	0.5
Min	1.0	1.0	1.0	0.0	2.0	2.0	0.0
Max	1.0	6.0	6.0	1.0	6.0	6.0	1.0
				Processors			
N = 5							
Average	8.8	34.4	4.05	0.0	34.4	4.05	0.6
Std. dev.	5.3	22.3	0.7	0.0.	22.3	0.7	0.4
Min	2.0	9.0	2.7	0.0	9.0	2.7	0.0
Max	16.0	75.0	4.7	0.0	75.0	4.7	1.0

Note. Participation in Quahogging determined by Whether Quahogs Landed 1985–1986 or Informant Report of Quahogging in 1987.

[a]Crew = Deckhands, mates, captains who work on board the vessel.

[b]Total Crew = Crew plus owner(s) who work on board the vessel. There may be several owners per firm (up to four in this sample) who also work on the vessel.

[c]Fleets = Group of vessels with one owner, not vertically integrated with processing. Individuals = Vessels owned by firms with no other vessels and no processing firms. Processors = Vertically integrated fleets.

helping to maintain employment in that fleet, and these vessels were among the largest in the fishery.

Both vessel size and participation in ocean quahogging are positively correlated with crew size. Indeed, vessel size itself is an important determinant of crew size. It is neither possible nor sensible to distinguish the weight of these factors. Because of small numbers we cannot statistically separate them. And the influences have an essential circularity that statistical manipulation would do little to change. Ocean quahogging requires more seaworthy vessels than does surf clamming, i.e. large vessels. On the other hand, investment in a larger vessel may force one to engage in ocean quahogging as well as surf clamming to pay off the bills.

If a vessel with a mid-Atlantic EEZ surf clam permit also engages in ocean quahogging, its fishing time is greatly extended. The owners we talked with emphasized this factor; a vessel without a market for ocean quahogs cannot support a full-time crew and, indeed, is likely to experience difficulty attracting and keeping reliable crew members when they are needed. Whether a vessel is used for ocean quahogging or not depends on several things including its size and seaworthiness (ocean quahogs are usually found in commercial quantities in deeper and more distant waters than are surf clams) and whether the owner has a buyer for the ocean quahogs caught. There are, of course, other determinants of crew size including whether two dredges are used, whether a stern rig or side rig outfit, whether sorting is done mechanically, etc.

The New Jersey inshore surf clam fishery, which takes place from November to May, provides an alternative for the smaller vessels that are less well suited to ocean quahogging, but participation in this fishery has a much lower impact on average crew size than does ocean quahogging. One obvious intervening variable is the size of the vessel. The smaller vessels are more likely to be in the Jersey inshore fishery in the winter months and are also, given their smaller size, likely to have smaller crews. Another alternative is a fishery for surf clams on Georges Bank, off the coast of New England. A few vessels, mostly owned by large processors, are engaged in this fishery from time to time but distance from port and from markets make it unattractive to most.

Discussion: Diversity and Flexibility

Diversification into the ocean quahog fishery and the New Jersey inshore surf clam fishery are ways to keep capital and labor profitably employed. Diversification is a strategy the success of which depends on the market, that is price and the relative bargaining power of buyers and sellers. Marketing surf clams and ocean quahogs was a big problem for independent clammers by the summer of 1987. There was a glut on the market, and processors changed some of their purchasing conditions, i.e. requiring that clams (ocean quahogs) be brought to the docks at the processing firms rather than trucked. Some also increased use of their own vessels to harvest clams.[4]

One result was sharp reduction in the market for ocean quahogs caught by many of the independents. Another was increased selling and buying of vessels, restructuring ownership patterns. A third was the beginning of a search for other fisheries. A few of the owners who have no market for ocean quahogs and are not in the New Jersey inshore fishery had begun to outfit for or explore the possibility of scalloping and finfish dragging by 1987. They had reached the critical point of not being able to maintain even a small cadre of deckhands and captains without finding alternatives to mid-Atlantic surf clamming.

A decision by the regional director of NMFS in early 1987 to allow more flexible choice of days for mid-Atlantic surf clam trips (known as "pick your days") bought time for those caught in this bind: for the first time in many years, it became both desirable and possible to explore alternatives to either surf clamming or ocean quahogging. Before, firm managers had little flexibility because allowable fishing days were spread out over the year to meet processors' desires for steady supply. A few firms have developed nonclamming alternatives since 1987. The costs of gear change (i.e. for otter trawls or

scallop dredges) are high; moreover, finding markets for other fisheries is not easy either. And the owner must be prepared to invest time and money and find markets, and his captain and crew must acquire the skills and specialized knowledge necessary to succeed in a new fishery.

The recent change allowing vessel owners to choose their own clamming days let vessel owners better coordinate their crews to work on several vessels. The "pick your days" system provides flexibility in this and other ways, including the possibility of obtaining reduced insurance rates by tying up a vessel for an extended period of time. However, flexibility of the independents is limited by their dependence on buyers of clams, a dependency that increases when demand is low, as in recent years characterized by inventory gluts.

Reducing the number of hired crew also has the potential of helping owners deal with rising insurance costs, which many feel have risen for this industry partly because of higher risks occasioned by the race to catch as many surf clams as possible within a limited time, i.e. 6 hours every two or three weeks. Owners and managers can select for the more reliable and less injury-prone crew.

Our analysis does not suggest a major reduction in crew employment for the industry as a whole with decline in the number of allowable fishing days in the mid-Atlantic surf clam fishery. Ocean quahogging, in particular, has maintained a fairly high demand for able-bodied deckhands and skilled mates and captains in some sectors of the industry. However, crew consolidation is taking place. The need to reduce labor seems to be concentrated among the independent fleets and the individuals who lack access to the ocean quahog fishery and who are reducing crew employment as one way to manage in relatively difficult times.

The consequences of crew consolidation strategies may also be particularly problematic for people who usually are employed as captains and those who aspire to that position. Many of our informants told us that the major consolidation of labor has been in the use of captains. Our data do not allow us to separate captains from other crew in analyses of crew size. However, a separate study of job satisfaction, discussed later, showed that the hired captains in the sea clamming fleet were often the ones most dependent on sea clamming, in terms of ranges of experience and degree of reliance on sea clamming for an income.

Crew-Members and Their Alternatives

The Job Satisfaction Survey, 1984–1985

A study of job satisfaction in New Jersey fisheries adds another approach to employment statistics and our crewing study in helping to interpret the employment situation of sea clammers and hence the social impact of changes in the industry, including management-induced changes, that may reduce labor needs. In 1984 and 1985, as part of a larger study (Gatewood and McCay 1988, 1989, 1990), we interviewed 68 sea clammers who worked on boats based in New Jersey ports. Twenty-nine were deckhands, 14 mates, 15 hired captains, and 10 were owners who also captained the vessel.

The New Jersey sea-clammers we interviewed are central to and fairly representative of fishermen in the larger mid-Atlantic sea clam fishery. More surf clams and ocean quahogs are landed by New Jersey vessels than by vessels from other states. We lack quantitative data on sea clam fishermen from Delaware, Maryland, and Virginia, but

have spent several months engaged in fieldwork interviews with owners, captains, and crews from these ports. We are confident that the differences, if any, in educational background, ethnicity, or access to alternative employment opportunities are not important. Sea clam crewmen in all regions tend to be white Americans of Western European extraction, with something close to a high school education, and background and some experience in mostly blue collar work besides fishing. Although alternative land-based employment is scarce in the southern states, the mobility of crewmen is high within the fisheries. In the larger job satisfaction study we found that 26.4% of the 401 N.J. fishermen we interviewed originally came from other mid-Atlantic states (Gatewood and McCay 1988: 107).

The vessels in the sample are representative of the industry at large in terms of length and tonnage as well as enterprise type (McCay, Creed, and Gatewood 1987). The media length was 75 feet (range 54–125 feet) and media tonnage (gross registered tons) was 121 (range 37 to 194). About half the respondents were associated with owner-operated or small fleet operations (two or three vessels owned by the same person or family), and the rest worked in the context of large and vertically integrated fleets.

Our job satisfaction study showed that sea clamming is, for some, a highly treasured way of life, for others the only thing they know, and for most clammers, the most remunerative—and satisfying—of the work opportunities available to them given their levels of education, training, and experience.

The sea clammers in the 1984–1985 study were, on the average, fairly well educated and thus adaptable in a changing employment market: in the 1984–1985 study, 12 years of school was the median, 11.3 the average, for the sample (McCay, Creed, and Gatewood 1987) They are relatively young on the average: their median age in 1984–1985 was 30, with a range of 19–62. They are also, more than on the average, family men: 72.1% are married, and they have an average of 1.8 children. These data do not include information on past marriages and separations; the industry is known for high divorce rates. Making major changes is more disruptive for those who are married and with children than those not and without, but it can also be argued that clammers who are married are more likely to have a second source of income in the household (unfortunately we lack data on this question).

Although participation in surf-clamming has been severely limited by the management system, very few clammers are part-timers. Fishing was the major, for most the only, source of income for sea clammers in this study. Eighty-five percent said that they were dependent on fishing for three-quarters or more of their income (the highest choice we offered), and most of these added the comment either verbally or on the interview form that all of their income came from fishing. The hired members of the crew—deckhands, mates, and hired captains—are more dependent on fishing than are the owners, some of whom have other income-producing investments. Hired captains all said that they depended on fishing for three-quarters or more of their income; over 85% of the deckhands and mates also said this.

Over the past decade of limited entry management, sea clammers have become accustomed to relatively good incomes from fishing for surf clams and ocean quahogs. Although we have no reason to believe that surf clammers are more likely than the general population to volunteer full and accurate information about their incomes to outsiders doing surveys, our income data are consistent with other sources of information and are particularly meaningful when compared with answers to the same question from people in other fisheries. As expected, owners and captains make far more money

than do regular crew (deckhands) and mates. Incomes have reportedly declined for some participants in the sea clam fishery since 1985, because of market problems, but sea clammers, whether deckhands, mates, or captains, make higher incomes on the average than do people in other mid-Atlantic fisheries (Table 3).

Moreover, our job satisfaction study shows that sea-clammers tend to be "in it for the money." On the average and much more so than people in other fisheries, sea clammers were more satisfied with the financial rewards of their work than with other dimensions of it (adventure, work schedules, opportunity to be own boss, etc.) (Gatewood and McCay 1988, 1989, 1990). They are less likely to find other fisheries to their liking.

Most clammers had been involved in other fisheries in the past, but few wished to make a switch from sea clamming to one of those others. Twenty-one out of the 24 captains reported experience in fishing other than sea clamming. The captains interviewed, all then working out of New Jersey ports, named these as their other fisheries: finfish dragging, quahogging (people often distinguished between surf clamming and ocean quahogging in that study in 1984–1985), scalloping, pot fishing (for lobsters, some sea bass), gill-netting, longlining (for swordfish, tuna, tilefish), bay clamming, work on party and charter boats, bay crabbing and eeling, catching mussels, and oystering. In other words, they have been involved in the full range of mid-Atlantic fisheries as well as fisheries in other regions such as Gulf Coast shrimping and Alaskan king crab fishing.

The other fisheries in which mates and deckhands in this study have worked are almost identical to those named by captains except that mates and deckhands were much more likely to have been involved in sea scalloping and bay clamming. Mates and deckhands are far more dependent than captains on sea clamming in terms of past experience: 10 out of 40 (25%) had done no other kind of fishing (McCay, Creed, and Gatewood 1987).

Although people have participated in another fishery, they may or may not like the one they are in or prefer it to another choice. We asked respondents which was their favorite fishery and why. Relating current fishery to choice of favorite fishery, we found that 75% of the sea clammers in the study chose sea clamming as their favorite, typically because of the money to be made (1984, when most of these interviews were done, was near the end of a boom period in the industry). This level of contentedness among participants in the sea clam fishery is moderately high: oystermen and scallopers were

Table 3
Fishing Income by Fishery,
1984–1986 New Jersey Fishermen

Fishery	N	Mean ($)
Sea clamming	65	27,700
Dragging	70	25,700
Longlining	50	24,000
Scalloping	75	23,800
Bay clamming	52	15,500
Oystering	49	14,600

[F = 14.038, P = .000]

Table 4
Type of Work Other than Fishing with Which Informant Has Experience, New Jersey Sea Clammers 1984–1985

Categories	Crew	Mates	Captain Nonowner	Captain Owner	Total	(%)
No response	3		3	1	7	10.3
Fisherman					0	0.0
Farm	2		1	1	4	5.9
Pri. serv.					0	0.0
Service	4	3	1	1	9	13.2
Laborer	8	4	1	1	13	19
Operative	1			1	2	2.9
Craft	7	6	7	5	25	36.8
Clerical	2				2	2.9
Sales	1				1	1.5
Manager	1	1		1	3	4.4
Professional					0	0.0

Note. The specific occupations held by participants in this study are: roofer, carpenter, painter, welder, machinist, well driller, diesel mechanic, plumbing, masonry, draftsman, hydraulics, electrician, landscaper, bulkheading, fish packing, custom steel fabricator, boat repair, cabinetmaker, maintenance engineer, logger, firewood cutter, house painter, bartender, cook, waiter/busboy, boat captain, taxi cab driver, truck driver, heavy equipment operator, motel manager, campground manager, bar owner, race track outrider, road maintenance, radio announcer, photography, aerial advertisement; work in cranberry industry, farming, and logging.

far more likely to choose other fisheries as their favorite (only 44% and 36% respectively chose oystering or scalloping), while baymen (clammers, crabbers, etc.), longliner fishermen, and draggermen were close to but somewhat higher than the sea clammers (79%, 83%, and 82% respectively) (Gatewood and McCay 1988). The discontents among the sea clammers chose finfish dragging, longlining, lobstering, scalloping, gillnetting, and trolling, in that order, as their favorites.[5]

Over 85% of the sea clammer respondents in the 1984–1985 study had done work besides fishing (McCay, Creed and Gatewood 1987), and the hired captains were the least likely to have had other work experience or, conversely, the most dependent on fishing. New Jersey sea clammers have a wide range of nonfishing work experience and background, primarily in blue-collar occupations. Almost 30% of the respondents had fathers who were mainly fishermen; the other major categories are laborers and craftsmen, generally the blue collar occupations. None had fathers who could be classified as professional, and very few (5.9%) had fathers with managerial positions. The respondents themselves fit this pattern. Like their fathers, most of the sea clammers have been in the blue collar occupations, as laborers and craftsmen, as well as the service occupations (Table 4).

We asked fishermen to compare nonfishing jobs they had with their current fishing work. The sea clammers emphasized the money to be made in sea clamming in comparison with other jobs they have had and were generally satisfied with sea clamming, but they were equivocal about how it compares with other work in terms of enjoyment of the

Table 5
Estimates of Nonfishing Economic Opportunity by Fishery, New Jersey Job Satisfaction Study

Item	Clam	Scallop	Oyster	Dragger	Longline	Bay F	F Prob.
Time to find other work	1.71	1.93	2.43	2.06	1.78	2.37	.003
Time to find work you enjoy as much as present fishing	2.95	2.81	3.50	3.30	3.02	3.66	.009
"Psychic cost" of not fishing (B–A)	1.17	.86	1.04	1.22	1.31	1.29	.437

Note: Scale = (1) a few days to (5) never.

work itself and time for other activities (Gatewood and McCay 1988, 1989, 1990). We also asked fishermen how long they thought it would take to find (A) another job, and (B) another job they liked as well as their current fishery. The scale was (1) a few days; (2) a few weeks; (3) a few months; (4) a year of longer; (5) never (you could not do anything else). As seen in Table 5, the sea clammers expressed some optimism about finding other work (average 1.71 on the scale) but less for finding work as enjoyable as surf clamming/ocean quahogging (average 2.95 on the scale). We computed a psychic cost of not fishing, in terms of the difference between the time it would take to find a job and the time it would take to find a job the respondent likes as much as fishing, and found that for all fisheries in the study there is a considerable difference. In a separate analysis, not shown here, we arrayed these data by status (captain, first mate, crew), and found that this psychic cost was significantly higher for captains and first mates than for crew (deckhands) (Gatewood and McCay 1988).

Summary Description of New Jersey Sea Clammers

In summary, sea clammers ranging from captains to deckhands prefer to remain in the surf clam and/or ocean quahog fisheries but have a very wide range of experience in mid-Atlantic and other fisheries. Sea clammers also have varied experience in nonfishing work. Their experience is primarily in the service, labor, and craftsman categories. When comparing previous work with present fishing, sea clammers, on the average, said that other work was unlikely to give the same income satisfaction, and that it would take longer to find a job that provided that satisfaction. This varies with crew status. Captains and mates derive the most satisfaction from sea clamming and would suffer the most if forced to quit. Hired (nonowner) captains may be the most vulnerable: not only do they derive high levels of satisfaction from sea clamming, but they are less likely than members of other status groups to have experience in nonfishing work. Mates, deckhands, and hired captains are all more dependent on clamming for a living than are owner captains, and mates and deckhands have had less experience in other fisheries.

These findings will have to be placed against information on regional and local labor markets to predict the impacts of changes in employment in sea clamming. There may, in the short term, be no economic problem at all for deckhands, mates, and hired captains who are looking for other work. The problem may be more that of firm managers in finding deckhands, mates, and hired captains to work under the conditions prevalent in the sea clam industry. Firms in the sea clam industry in some of the more

rural areas report difficulty finding reliable people to work on the boats (and in processing) because of competition for labor with other employers, even in the seasonal, high unemployment counties. Recent discussions with crewmen indicate that those who cannot be assured steady employment by fleet owners or on a quahog vessel have found other employment and use their sporadic surf clam trips as a way to make extra money.

The major problem for crew-members is, rather, the one addressed in our job satisfaction study: finding a job one likes as well as or better than sea clamming. In that study what people liked most of all was the chance to make good money, and thus the attractiveness of surf clamming and ocean quahogging compared with alternatives is changeable, depending on economic conditions and the power of labor both within and without the industry.

Data collected on the other fishing and nonfishing work experiences of sea clammers show a high level of participation in other mid-Atlantic fisheries. Most clammers have been involved in other fisheries but few wish (or wished in 1984–1985, when most of the sea clammers were interviewed) to make a switch. Sea clamming is, for some, a highly treasured way of life, for others the only thing they know, and for most clammers the most remunerative, and satisfying, of the work opportunities available to them given their levels of education, training, and experience. Relatively few (one-quarter) of those surveyed preferred another fishery; in descending order of preference were finfish dragging, longlining, lobstering, scalloping, gillnetting, and trolling. None of these is, at present, a growing fishery in the mid-Atlantic; all are in greater or lesser degrees of trouble. Accordingly, switching to another fishery will not be easy for those who choose or are forced to leave sea clamming.

Conclusions

We learned that mid-Atlantic surf clam vessel owners are both diversifying and cutting back on labor costs through crew consolidation in response to difficulties in the sea clam industry within the framework of limited entry management. The latter may displace some crew members. However, vessel owners are diversifying and consolidating crews also in response to labor shortages; it is difficult to get and keep good crew members (deckhands, mates, and hired captains) when the boat goes out very seldom, especially when there is also uncertainty about the market for clams. We also learned much more about crews and the industry. We have not formalized our analysis into a schematic model but we are prepared to make predictions from it.

Predictions

We offer predictions for how a new management regime, based on direct and transferable allocations of a quota to vessel owners, will affect labor. The predictions are based on (1) what we learned from the interviews discussed; (2) general assumptions about the profit-maximizing behavior of optimizing firms; (3) our understanding of how the crew members are likely to behave, based on our job satisfaction study; (4) what people involved in the industry and the management system tell us will happen; and (5) observation of the management process and informal interviews and participant-observation with members of the industry.

First, although surf clam vessel crews have already been consolidated by fleet own-

ers not using these vessels for ocean quahogging or inshore clamming, fleet consolidation of labor will accelerate. Increased crew consolidation and more layoffs will follow implementation of ITQs or any other plan amendments that allow owners of fleets of clam boats to combine on fewer boats the allowable fishing days, shares of the quota, or other rights or privileges created through the management processes. There may be some movement of vessels, and hence crews, into other fisheries. However, the moratorium system of management encouraged retention of old vessels in the fleet, and it is likely that when many of those vessels are retired from the sea clam fishery they will not be used for other fisheries.

In any case there will be fewer positions for crew members on sea clamming boats. Perhaps one-third of the surf clam vessel crewmen will lose their jobs within a year or so of the new regime. Those crew members who leave, if they are like those we studied in 1984–1985, have experience in other fisheries and jobs and are likely to be in regions with relatively low unemployment rates in the northern part of the mid-Atlantic (McCay and Creed 1987). Most will initially look for work that is related to fishing, either crewing on other types of vessels or doing dock work. They may, however, have trouble finding jobs that pay as well for little education and training, and that provide as much satisfaction (which, for sea-clammers, is about the same as good pay) as has sea-clamming.

If the system results in sharp reduction of vessels, a relatively small number of vessels and people will be sharing the resource rent that is captured by a limited entry system of management. Crew-members who stay on may prosper even more than they have within the vessel moratorium, but it is as possible that owners will readjust the share system to enhance their profits or maintain their positions within an increasingly competitive industry.[6] We predict that the crew who remain on surf clam vessels will work longer hours and have higher incomes than during the period from late 1986 to present. Surf clam vessel owners will readjust the share system so they can capture a higher percentage of the profits from their more efficient vessels. They will be able to do so because of the scarcity of employment in the fishery and the relatively high income it offers.

Ocean quahog vessels should not operate any differently than they do now, because current management rules do not restrict the number of trips they can take. Under the new regime market demand, vessel maintenance requirements, and the density and location of ocean quahog beds will dictate the number and length of trips taken by ocean quahog vessels. The next major change in this fishery, based on industry comments at the amendment hearings and at Surf Clam committee and council meetings, will be shucking at sea, which may result in new labor arrangements and relationships to capital and management.

Bringing Crews and Labor into the Management Process

We have examined selected features of crewing and crews in the harvesting sector of the surf clam and ocean quahog industry of the mid-Atlantic region of the United States and made predictions about the impacts of a new management regime. Our analysis, which will be expanded in the future to include labor in the processing sector, is also intended to bring questions concerning labor into public debates about allocating rights to common resources. Our concluding remarks concern why, at least in the mid-Atlantic sea-clam fishery, the issue of what will happen to labor has not been part of those public debates.

In the numerous reports, discussions, and meetings of the Mid-Atlantic Fishery Management Council, its committees, and other groups, concerns about the effects of changes in the management system have dealt almost exclusively with two major social groups in the fishery: vessel owners and processors. Two other important social groups have been invisible: crew-members (including hired captains) and workers in processing firms. Crew-members and processing plant workers have had little say and virtually no attention given to them in the debate over how to amend the management system even though they are the ones whose lives may be most dramatically altered.

Crew members and crewing issues are seemingly invisible to most deliberations on fishery management in the United States. The invisibility of labor issues may be particular to certain conditions and fisheries. For example, where fishing enterprises are seldom structured by kinship and close friendship ties, and where vessel operators are as likely to be hired captains as owners of the vessels, the divergence of interests of labor and management or capital is more obvious, and owners cannot be relied on to represent their crew members in the management arena. These conditions apply to the mid-Atlantic region's sea clam fisheries, where kinship is not the dominant connection between people on a boat[7] and owner-operators, although numerous, control only part of the vessels in the fishery. According to our findings, as of December 1987, 47% of the 142 licensed surf clam vessels (and an even higher share of catching power) were owned by six firms, of which four were vertically integrated companies. Buying and selling of vessels has been intense in subsequent years (we use 1987 as the cut-off date for this study but are following the management process in other research), but the pattern remains of an industry dominated by a few large firms, some vertically integrated and some not. In such fisheries crew members are not always able to depend on the owners, or even the captains, to fully represent and even communicate with them with regard to management policy. And because the crew members may have few ties to the owners or the operators, they are not likely to attend management meetings.

We suspect that the lack of attention to labor questions we observe is more pervasive in U.S. fisheries management. One reason for an extended silence on labor issues may be that U.S. marine fisheries management is less explicitly connected with community development and social policy issues than is management in nations such as Canada, Norway, and Iceland where fishing is far more important within the larger economy. Nor are many crewmen in U.S. fisheries organized in unions or other trade associations that serve as lobbyists and communicators and also help maintain working class consciousness. Another is that under the 1977 Magnuson Act, which created a decentralized, regional system of management for fisheries from 3 to 200 miles from the coastal baseline, it is possible for interest group politics to be dominated by a few large firms so that the interests of vessel owners and seafood processors are usually more explicitly addressed than those of the captains, mates, deckhands, and processing plant employees who work for them. In addition, administration of the Magnuson Act has been such that adequate social impact analyses need not be done for fishery management plans to be approved (Fricke 1985). Those that are done suffer from the lack of adequate data on labor practices, patterns, and opportunities. NMFS collects very little data on either harvesting or processing labor. Aggregate U.S. Census and Department of Labor data on employment and unemployment for coastal counties and even municipalities rarely identify fishermen.

For these and other reasons, although the issue of the effects of a particular management regime on labor and employment opportunities is recognized in discussions of social impacts and mandated in FMPs, it rarely appears in either formal

deliberations of the Mid-Atlantic Fishery Management Council or the impact analyses in its FMPs. This is particularly unfortunate when management alternatives have the intended or unintended consequence of reducing employment and changing the labor process in a fishery.

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Notes

1. In 1987 there were 142 permitted vessels for the mid-Atlantic surf clam fishery but only 133 actually landing surf clams; this pattern is typical, as some vessels are laid up for various reasons and others are used for ocean quahogging.

2. In 1987 fishermen were given more choice about when they worked (see page 319).

3. It was difficult to obtain these data partly because companies did not always have readily accessible information on the actual number of people working the vessels and partly because of confusion regarding the difference between number of people employed and how many go out on each vessel, i.e., the fact of crew consolidation. Where we sensed confusion might be a problem we made one or more return telephone calls for clarification.

4. Increased vertical integration of harvesting and processing was not a response to market glut but rather an attempt to improve reliability of supplies and, perhaps, to try to improve positions in relation to anticipated regulatory changes.

5. The job satisfaction study was done at a time when the Atlantic sea scallop fishery was at an all-time low. By 1989 the scallop fishery had rebounded to an all-time high. As one reviewer notes, this change, like changes in other fisheries, may affect how people rank different fisheries.

6. By "increasingly competitive" we refer to the loss of management-induced protection for smaller and older vessels. Even the old, inefficient vessels maintained value for their owners in the system partly because they could, with the right crew, produce just about as well under the tight restrictions of 6 hours every few weeks, but also because their permits were themselves carriers of value in this limited entry fishery. With individual transferable quotas, value will be more closely linked to actual performance. In another sense, competition may decrease with fewer sellers and perhaps buyers, i.e., the monopolistic scenario.

7. In our job satisfaction study we did not ask about kinship ties among members of a crew because our units of analysis were individuals. However, we have an indirect measure of the importance of kinship: father's main occupation. For the sea clammers in the study, only 28% had fathers who were or are fishermen. In contrast 38% had fathers who were or are laborers, operatives, or in the craft trades, and fathers of the rest fit into other occupational categories.

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